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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/527,463	08/24/2005	Siobhan Olive Matthews	26661U	3584
20529 7590 08/12/2009 THE NATH LAW GROUP 112 South West Street Alexandria, VA 22314				
EXAMINER				
DRODGE, JOSEPH W				
ART UNIT		PAPER NUMBER		
1797				
MAIL DATE		DELIVERY MODE		
08/12/2009		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/527,463

Applicant(s)

MATTHEWS ET AL.

Examiner

Joseph W. Drodge

Art Unit

1797

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 August 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,4-15 and 17-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,4-15 and 17-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/S508)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1,4, 7-15 and 17-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Starke et al patent 5,816,700 in view of Prince et al patent 5,308,648 and Hoy et al patent 5,108,799.

For independent claims 1 and 22, Starke et al disclose combining of multiple materials in passage through a multi-stage processing mixer, with subsequent materials being added and then

mixed in sequential stages. The materials being mixed include plastics and other polymers. Viscosity reducing material(s), plasticizing agents and solvents or co-solvents, which include supercritical carbon dioxide, are added in the 1st and subsequent processing/mixing stages. It is stated that the mixer may be used to generate solutions of polymers and fluids that are solvents for the polymers at autogenous pressure. The materials being mixed are processed by being heated/plasticized/melted in the mixing/processing vessel. Designation of materials being mixed as "bulk" and "functional" are arbitrary.

Starke discloses that an "homogenous mixture" is generated, however does not explicitly state that the mixed materials are in solution, or form a single phase.

Also, Starke discloses the mixed fluid material is released through a pressure-reducing nozzle 52, however, is silent as to whether fluid(s) including the supercritical carbon dioxide are removed.

For claims 1 and 22, Prince et al teaches combining of 1st and 2nd polymer materials in a process comprising: providing at least one near-critical or supercritical fluid in the form of a "viscosity reducing material" (see column 5, lines 3-5) to form a single phase solution with the materials and then removing the fluid from the solution as a result of the volatility of the supercritical fluid (see especially column 6, lines 13-15). The disclosed first "at least one polymer additive material" is dissolved in a 2nd material fluid ("at least one liquid carrier material", see column 4, lines 49-54). Since the viscosity-reducing material is "mixed" with the liquid carrier material fluid and a single, sprayable (column 6, lines 2-8), phase is formed, the first polymer additive material(s) become dissolved in the mixture, hence dissolved in the near-critical supercritical fluid/viscosity reducing material forming a single phase solution (column 6,

lines 9-14, column 7, lines 42-48, column 8, line 63-column 9, line 10). A single phase solution may be formed where the fluid is "near-critical" and below its critical temperature or pressure (column 5, lines 17-29).

The supercritical fluid is volatile, so removed from the solution, later during spraying, in order to leave the 1st and 2nd materials (which is/are non-volatile) in a combined, form (column 4, lines 53-55 and column 6, lines 12-14). Also see column 9, line 65-column 10, line 5 concerning "solubility limit" of additive mixture and viscosity reducer/supercritical fluid with carrier material fluid, and column 7, lines 45-47 regarding viscosity reducing material being soluble in mixture of liquid carrier and polymer additive.

Hoy also discloses heating and mixing coating materials to be sprayed, using solvent and supercritical carbon dioxide as co-solvent or diluent, forming a multi-phase or single phase mixture, with the supercritical fluid being released or removed from the mixture upon spraying (column 3, lines 21-59 and column 8, lines 39-63).

In summary, it would have been obvious to one of ordinary skill in the coatings manufacturing and applying arts, to have operated the Starke et al system using parameters (pressures, temperatures, flow-rates, choice of solvents, etc.) in such manner to form a single-phase solution and then later release/removal of fluid(s) including supercritical carbon dioxide, as taught by Hoy et al and Prince et al, in order to form a continuously, uniform coating material allowing it to be evenly and uniformly applied to desired substrate or end use.

With regard to dependent claims, the following is also disclosed by Starke: materials may be provided in melted state for claims 4 and 18 (column 5, line 28), heating constitutes processing of the carbon-dioxide containing mixture for claims 7 and 8, extrusion is applied for

claims 9 and 19-20 (column 5, line 25), solvent, property-changing materials and plasticizing agents are added for claims 10-15 (column 5, lines 47-65 and column 14, lines 19-22), process is continuous for claim 17 (column 5, line 20)

Prince et al also teach the following for dependent claims: sequentially dissolving plural materials in the fluid as a result of their separate introduction or separate rates of dissolving (column 9, lines 5-10); materials in solid or semi-solid state for claim 4 (column 9, line 3 "slurries"); the fluid being carbon dioxide for claim 7 (column 5, lines 31-40); solution/formed material processing for claim 8 (column 8, lines 49-50); polymer melt processing such as extrusion molding for claims 9 and 18-20 (column 18, line 47); the process being continuous (column 8, lines 4-6) for claim 17, function-altering material for claim 10 (column 4, line 52-53); the materials at least comprising plastics or polymers for claims 11 and 15 (column 4, line 52 etc.); addition of plural supercritical fluids that act as co-solvents selected among alcohols, pentane etc. for claims 12 and 14 (column 8, lines 65-68 with column 5, lines 30-35; addition of solvents and materials in varied proportions for claim 13 (column 10, lines 1-10); and providing and combining means including tanks and conduits for claim 16 (figures); fluid swelling is neither mentioned or precluded by any of the prior art for claim 2.

Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Starke et al patent 5,816,700 in view of Prince et al patent 5,308,648 and Hoy et al patent 5,108,799, as applied to claims 1,4,7-15 and 17-22 and further in view of DeSimone patent 5,922,833.

Claims 5 and 6 further differ in requiring that the carbon dioxide being removed by the material by venting or suction, although Prince et al does disclose the fluid being volatile so as to

separate from the material formed by mixing. DeSimone teaches to remove carbon dioxide from formed polymeric materials by venting and suction process steps (column 5, lines 47-54, column 9, lines 44-49 and column 10, lines 18-23. It would have been obvious to one of ordinary skill in the art to have utilized the suction and venting of DeSimone in the process, to more thoroughly remove all of the supercritical fluids to form a more purified end product.

Applicant's arguments filed on 08/04/2009 have been fully considered but they are not persuasive, especially in view of the new grounds of rejection. The method limitations requiring sequential addition of ingredients and introduction of additional materials after mixing of supercritical carbon dioxide, is clearly disclosed in newly applied Starke et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Drodge at his direct government telephone number of 571-272-1140. The examiner can normally be reached on Monday-Friday from approximately 8:30 AM to 12:30 PM and 2:00 PM to 6:00 PM.

Alternatively, to contact the examiner, send a communication via E-mail communication to the Examiner's Patent Office E-mail address: "Joseph.Drodge@uspto.gov". Such E-mail communication should be in accordance with provisions of MPEP (Manual of Patent Examination Procedures) section 502.03 & related MPEP sections. E-mail communication must begin with a statement authorizing the E-mail communication and acknowledging that such communication is not secure and will be made of record, under Patent Internet Usage Policy Article 5. A suggested format for such authorization is as follows: "Recognizing that Internet communications are not secure, I hereby authorize the USPTO to communicate with me

concerning any subject matter of this application by electronic mail. I understand that a copy of these communications will be made of record in the application file.

Additionally, the examiner's supervisor, Duane Smith, of Technology Center Unit 1797, can be reached at 571-272-1166.

The formal facsimile phone number, for official, formal communications, for the examining group where this application is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either private PAIR or Public PAIR, and through Private PAIR only for unpublished applications. For more information about the PAIR system, see [http://www.uspto.gov/patent/pair/](#). Should you have any questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JWD
8/10/2009
/Joseph W. Drodge/
Primary Examiner, Art Unit 1797